URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
FAX: (303) 291-8296

December 19, 2011

Ms. Joyce Ackerman
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-SA
1595 Wynkoop Street
Denver, Colorado 80202-1129

SUBJECT: **START 3, EPA Region 8, Contract No. EP-W-05-050, TDD Nos. 1105-09 and 1109-07, Draft Sampling Activities Report for a combined Site Inspection and Removal Assessment of the Smurfit-Stone Mill, near Missoula, Missoula County, Montana**

Dear Ms. Ackerman:

Attached is one copy of the draft Sampling Activities Report for a combined Site Inspection (SI) and Removal Assessment (RA) of the Smurfit-Stone Mill, near Missoula, Missoula County, Montana, conducted in October, 2011.

This document is submitted for your review and comments. If you have any questions, please call me at 303-291-8212.

Very truly yours,

URS OPERATING SERVICES, INC.

Jeff Miller
Project Manager

cc: Charles W. Baker/UOS (w/o attachment)
Jeff Miller/UOS
File/UOS

URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
FAX: (303) 291-8296

December 19, 2011

Mr. Robert Parker
Site Assessment Manager
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-B
1595 Wynkoop Street
Denver, Colorado 80202-1129

SUBJECT: **START 3, EPA Region 8, Contract No. EP-W-05-050, TDD Nos. 1105-09 and 1109-07, Draft Sampling Activities Report for a combined Site Inspection and Removal Assessment of the Smurfit-Stone Mill, near Missoula, Missoula County, Montana**

Dear Mr. Parker:

Attached is one copy of the draft Sampling Activities Report for a combined Site Inspection (SI) and Removal Assessment (RA) of the Smurfit-Stone Mill, near Missoula, Missoula County, Montana, conducted in October, 2011.

This document is submitted for your review and comments. If you have any questions, please call me at 303-291-8212.

Very truly yours,

URS OPERATING SERVICES, INC.

Jeff Miller
Project Manager

cc: Charles W. Baker/UOS (w/o attachment)
Jeff Miller/UOS
File/UOS

START 3

Superfund Technical Assessment and Response Team 3 – Region 8

United States
Environmental Protection Agency
Contract No. EP-W-05-050

SAMPLING ACTIVITIES REPORT
for a
COMBINED SITE INSPECTION and REMOVAL ASSESSMENT

SMURFIT-STONE MILL
Near Missoula, Missoula County, Montana

TDD Nos. 1105-09 and 1109-07

December 19, 2011

URS
OPERATING SERVICES, INC.

In association with:
Garry Struthers Associates, Inc.
LT Environmental, Inc.
TechLaw, Inc.
Tetra Tech EMI
TN & Associates, Inc.

SAMPLING ACTIVITIES REPORT
for a combined
SITE INSPECTION
and
REMOVAL ASSESSMENT
at the
SMURFIT-STONE MILL
Near Missoula, Missoula County, Montana

(CERCLIS ID #: MTN000802850)

EPA Contract No. EP-W-05-050
TDD Nos. 1105-09 and 1109-07

Prepared By:
Jeff Miller
Senior Environmental Scientist

URS Operating Services, Inc.
1099 18th Street, Suite 710
Denver, CO 80202-1908

Approved: _____ Date: _____
Joyce Ackerman, On-Scene Coordinator, EPA, Region 8

Approved: _____ Date: _____
Robert Parker, Site Assessment Manager, EPA, Region 8

Approved: _____ Date: _____
Charles W. Baker, START 3 Program Manager, UOS

Approved: _____ Date: 12/15/11
Jeff Miller, Project Manager, START 3, UOS

SAMPLING ACTIVITIES REPORT
for a combined
SITE INSPECTION
and
REMOVAL ASSESSMENT
at the
SMURFIT-STONE MILL
Near Missoula, Missoula County, Montana

(CERCLIS ID #: MTN000802850)

EPA Contract No. EP-W-05-050
TDD Nos. 1105-09 and 1109-07

Prepared By:
Jeff Miller
Senior Environmental Scientist

URS Operating Services, Inc.
1099 18th Street, Suite 710
Denver, CO 80202-1908

Approved: _____ Date: 4-8-13
Joyce Ackerman, On-Scene Coordinator, EPA, Region 8

Approved: _____ Date: 4/8/13
Robert Parker, Site Assessment Manager, EPA, Region 8

Approved: _____ Date: 4/5/13
Charles W. Baker, START 3 Program Manager, UOS

Approved: _____ Date: 4/5/13
Jeff Miller, Project Manager, START 3, UOS

DISTRIBUTION LIST

U.S. ENVIRONMENTAL PROTECTION AGENCY

Joyce Ackerman (1 copy)	On-Scene Coordinator, EPA Region 8
Robert Parker (1 copy)	Site Assessment Manager, EPA Region 8

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

John Arrigo (1 copy)	Administrator, Enforcement Division
Judy Hanson (1 copy)	Administrator, Permitting and Compliance Division
Sandra Olsen (1 copy)	Administrator, Remediation Division

MISSOULA CITY-COUNTY

Peter Nielsen (1 copy)	Environmental Health Supervisor, Missoula City-County Health Department

M2GREEN REDEVELOPMENT

Neal Marxer (1 copy)	Project Manager

URS OPERATING SERVICES, INC.

Jeff Miller	Project Manager, START 3, EPA Region 8
File (2 copies)	START 3, EPA Region 8

SAMPLING ACTIVITIES REPORT
for a combined
SITE INSPECTION
and
REMOVAL ASSESSMENT
at the
SMURFIT-STONE MILL
Near Missoula, Missoula County, Montana

CERCLIS ID#: MTN000802850

TABLE OF CONTENTS

1.0 INTRODUCTION

This Sampling Activities Report (SAR) for a combined Site Inspection (SI) and Removal Assessment (RA) of the Smurfit-Stone Mill site (CERCLIS ID# MTN000802850) ('the mill') near Missoula, Missoula County, Montana, (Figure 1) is submitted in accordance with the task elements specified in Technical Direction Documents (TDD) No. 1105-09 and 1109-07, issued to URS Operating Services, Inc. (UOS) by the Region VIII office of the U.S. Environmental Protection Agency (EPA) under Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050.

UOS prepared a Field Sampling Plan (FSP) that was submitted to the EPA on October 21, 2011 (UOS 2011b). The UOS FSP includes detailed background information, planned sample locations, and analytical parameters for the October 2011 sampling event.

UOS collected samples and conducted other work at the site from October 23 through 29, 2011. UOS was tasked with collecting split samples for the owner of the facility, M2Green Redevelopment, LLC, through their consulting firm Hydrometrics, Inc. Select photographs of the sampling activities are included in the Appendix. Robert Parker, Site Assessment Manager for the EPA, was present on site and accompanied UOS in the field on October 24. Joyce Ackerman, On-Scene Coordinator for the EPA, was present on site and accompanied UOS in the field from October 25 through 29.

The purpose of this combined SI and RA is 1) to determine if an immediate threat exists to the environment (particularly surface water receptor targets associated with the Clark Fork River or O'Keefe Creek), to individuals working on or accessing the property, or to individuals consuming water from nearby domestic wells; and 2) to evaluate information gathered from the site with regard to the EPA's Hazard Ranking System (HRS) criteria.

It should be noted that this sampling event did not examine every potential source area of the mill property (e.g., underground and aboveground storage tank locations), only those deemed to have the highest potential to contain hazardous substances associated with the mill.

The specific objectives of this assessment were to:

- Determine potential source areas and containment characteristics of potential source areas at the site, and evaluate these by HRS criteria;
- Determine if contaminants have been transported from potential site sources, or are likely to be transported from potential site sources via the surface water pathway through erosion in the

event of catastrophic flooding of the site, to the Clark Fork River or O'Keefe Creek, through direct discharge or through surface water or groundwater;

- Determine if contaminants have been transported from the site to nearby domestic groundwater wells, and if so, to determine if contamination is present above appropriate water quality standards and benchmarks;
- Evaluate if an exposure threat from site contaminants exists to on-site workers or other persons accessing the mill property, or to the environment, particularly to surface water receptor targets along the Clark Fork River and O'Keefe Creek, and;
- Document the recreational use (particularly for fishing) of the Clark Fork River in the vicinity of the mill.

2.0 SITE LOCATION AND DESCRIPTION

The Smurfit-Stone Mill was a large integrated pulp and paper mill that was in operation from 1957 through early 2010. The mill is located 11 miles northwest of the City of Missoula, in Missoula County, Montana and covers approximately 3,150 acres (Figure 1). The mill is located approximately 3 miles south of the town of Frenchtown and, therefore, has often been referred to as the Frenchtown Mill. The facility address is 14377 Pulp Mill Road, Missoula, and the coordinates of the industrial core of the mill facility are 46° 57′ 50.12″ north latitude and -114° 11′ 58.15″ west longitude.

The mill site is located in the northeastern portion of the U.S. Geological Survey (USGS) Primrose Quadrangle Map (USGS 1999). For planning purposes under this assessment, the site boundary is defined by the outside perimeter of the land parcels that constitute the mill property. The legal description of these parcels is provided in Appendix A of the PA report (UOS 2011a, Montana Department of Revenue [MDR] 2011). The site boundary is shown in Figures 1 and 2 (MDR 2011). The western boundary of the site is the Clark Fork River, with the site having approximately 4 miles of river frontage.

Under the HRS, the target distance limit (TDL) of the site is defined as a 4-mile radius surrounding the outside perimeter of the site, and the Clark Fork River to a distance 15 miles downstream of the most downstream probable point-of-entry (PPE) (Figure 1). This TDL includes the confluences of creeks draining into the Clark Fork River (Deep, Albert, O'Keefe, Mill, Sixmile, and Ninemile Creeks), as well as the Frenchtown Ponds State Park and portions of the Lolo National Forest. The site lies within the Montana Audubon Clark Fork River – Grass Valley Important Bird Area (Montana Audubon 2009).

The mill site lies within the Clark Fork River valley and is generally flat, with an elevation ranging from approximately 3,070 feet near the core industrial area of the mill to approximately 3,040 feet at the Clark

Fork River in the northwest corner of the site. Elevations within the 4-mile radius range from approximately 3,015 feet within the Clark Fork River valley to the northwest, to nearly 5,000 feet in the mountains to both the east and west.

The core industrial footprint of the 3,150-acre mill site covers approximately 100 acres. Over 900 acres of the site consist of a series of unlined ponds used to store both treated and untreated wastewater effluent from the mill, as well as primary sludge recovered from untreated wastewater. Additional unlined ponds were also subsequently used for landfilling various solid wastes produced at the mill. Much of the remaining acreage of the site (approximately 1,800 acres) is used for agricultural purposes, with over 1,200 acres of grasslands for cattle grazing and over 600 acres irrigated for alfalfa and grain crops (MDR 2011, Montana County Rural Initiatives 2010).

A more detailed history of the site, including timeline of the mill's history, process descriptions, and previous environmental investigations conducted at the mill, is included in the PA report (UOS 2011a).

Potential source areas on the site include: 4 sludge ponds (Sludge Ponds 3, 4, 5 and 17), an emergency spill pond (Pond 8, with two separate cells), 12 wastewater storage ponds, 3 wastewater treatment aeration basins, 2 polishing ponds, and a soil landfarming area. Only the four sludge ponds, the emergency spill pond, one wastewater storage pond, and the landfarming area were targeted for sampling during this assessment, as they were determined to have the highest potential for containing hazardous substances.

3.0 SAMPLE LOCATIONS, METHODS, AND DEVIATIONS FROM THE FSP

The FSP proposed approximately 66 field samples. The site investigation included the collection of 65 field samples and 5 field quality assurance/quality control (QA/QC) samples (Figure 2, Table 2). Specifically, samples collected included:

- Seventeen surface soil/source (0-2 feet below ground surface [bgs]) samples from potential source areas, including sludge ponds, the emergency spill pond, a wastewater storage pond, and a soil landfarming area (including one background location);
- Seven subsurface soil/ source (> 2 feet bgs) samples from sludge ponds and the emergency spill pond;
- Groundwater from eight temporary groundwater monitoring wells installed with a Geoprobe®, completed within the shallow aquifer at the site and located within and downgradient of

potential source areas, including the sludge ponds, the emergency spill pond, and landfills A and G;

- Groundwater from seven existing monitoring wells and one existing supply well located on the mill property, targeting wells located downgradient of the majority of source areas and adjacent to the Clark Fork River (six wells), and background locations (two wells);
- Groundwater from five domestic wells located adjacent to and downgradient of source areas;
- Ten co-located surface water and sediment samples, including from locations below 4 facility wastewater outfalls to the Clark Fork River, from O'Keefe Creek, and from background locations (20 total samples from 10 locations); and
- Five QA/QC samples, including two soil duplicate samples, two groundwater duplicate samples, and one rinsate blank. Four MS/MSD samples were also collected.

Specific sample locations were determined in the field based upon safe access and orientation to potential waste sources (e.g., a groundwater well installed downgradient of a potential source area). Sampling locations followed those pre-determined in the FSP with the following exceptions (Figure 2, Table 2):

- Subsurface soil samples SSSO10xx (Sludge Pond 5), SSSO12xx (Sludge Pond 4), and SSSO14xx (Emergency Spill Pond, wet cell); and Geoprobe® groundwater samples SSGW06 (Sludge Pond 4) and SSGW09 (Emergency Spill Pond wet cell) were not collected as the track-mounted Geoprobe® could not safely access these proposed sampling locations due to a soft surface (Photo 1).
- Geoprobe® groundwater sampling location SSGW07 was moved from within Sludge Pond 5 to a location on the berm between Sludge Ponds 4 and 5, due to the lack of safe access for the Geoprobe® to the proposed sampling location (Photo 2).
- Subsurface soil sampling locations SSSO11xx (Sludge Pond 4) and SSSO09xx (Sludge Pond 5) were moved from the center of each pond to the edge, due to the lack of safe access for the Geoprobe® to the proposed sampling locations (Photo 3).
- Surface soil samples SSSO0702, SSSO1002, SSSO1202, and SSSO1402 were collected directly from the surface of ponds with disposable plastic scoops, rather than from Geoprobe® macro-core sleeves, due to the lack of safe access for the Geoprobe® to the proposed sampling locations (Photo 4).
- Surface soil samples SSSO0502 and SSSO0602 were collected directly from the surface of ponds with disposable plastic scoops, rather than from Geoprobe® macro-core sleeves, in order

to expedite the sampling schedule (i.e., they were collected prior to the arrival of the Geoprobe® on site).

- Domestic well locations SSGW19 (Shields well), SSGW20 (Peterson well), SSGW21 (Linton well), and SSGW22 (D and P Lucier well) were not sampled, because the wells could not be located on the ground, or access to sample was either not granted or pursued. Domestic well SSGW23 (K Stenerson well) was located along Marcure Lane, approximately ¼ mile northwest of its assumed location.
- Opportunity sample SSSO1702 was added to the sample plan, being collected from an area of what appeared to be exposed soil/sludge adjacent to Landfill A (Photo 5).
- The second soil/ source replicate sample SSSO9902 was collected from a sludge location, rather than a sediment location, to ensure that sufficient number of replicates were collected for the sludge matrix.
- The second groundwater duplicate sample SSGW99 was collected from the SSGW26 location (D and L Lucier well) rather than the SSGW20 location (Peterson well) as the owner of the Peterson well was not available to grant access.

The deviations from the FSP described above are highlighted with shading in Table 2.

Augers or a slam bar with a core sampler were not used to collect surface soil/source samples as the equipment available from the EPA had too small of a capacity to collect both EPA samples and Smurfit-Stone splits samples in a timely manner. Instead, these samples were collected with disposable plastic scoops, either from Geoprobe® macro-core sleeves or directly from the surface of the potential source.

A steel shovel was sometimes needed to assist in the collection of source samples, due to the viscous nature of the material and the desire to collect material to a depth of 2 feet bgs. The shovel was decontaminated prior to its initial use and then between sampling locations as per the UOS Technical Standard Operating Procedure (TSOP) 4.11 "Equipment Decontamination" (UOS 2005). The same stainless steel cutting shoe was used for each Geoprobe® source and groundwater location. The cutting shoe is the only reusable part of the sampling system that makes contact with in situ soils. The drilling subcontractor, MSE Technology Application, Inc., decontaminated the cutting shoe prior to its initial use and then between sampling locations using a method equivalent to that in UOS TSOP 4.11. A rinsate blank (sample SSSW89) was collected from both the shovel and the cutting shoe to assess the quality and thoroughness of the decontaminating procedures used (Photo 6).

Groundwater samples were collected from the seven existing shallow groundwater monitoring wells by using dedicated Geosquirt™ disposable purge pumps, rather than with a peristaltic pump or disposable bailers, as they enable a much more rapid purge time. This greatly accelerated the sampling schedule.

Field screening of soils with immunoassay test kits was proposed for the landfarm area if visual evidence of contamination was not observed. The test kits were not used as an aerial photo was found that showed the entire land parcel had been used for landfarming (Photo 7), and specific areas devoid of vegetation were noted in the field (Photo 8).

Samples to be analyzed for chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans (CDDs/CDFs) (dioxins and furans) were sent to a private laboratory for analysis, rather than to an EPA CLP laboratory for non-Routine Analytical Services (non-RAS), as the CLP program was unable to perform the analyses during the time of the assessment.

The approved FSP stated that a 'limited number' of groundwater and surface soil samples would be analyzed for asbestos by a private laboratory. A total of three surface soil samples and two groundwater samples were collected and sent to a private laboratory for analysis.

Signed access forms were not gathered from the owners of the five domestic wells as the EPA OSC (Joyce Ackerman) gained verbal access prior to UOS sampling activities.

No other deviations from the approved FSP occurred.

4.0 SITE ACTIVITIES/ OBSERVATIONS

UOS conducted site work and collected samples from October 23 through 29, 2011. A photolog of select photographs of the sampling activities is included in the Appendix.

4.1 POTENTIAL SOURCES

Table 1 below summarizes source and source containment characteristics observed during the assessment. Although it may be possible to show an observed release to groundwater from various sources at the mill through direct observation (e.g., in cases where material containing a hazardous substance has been deposited directly into, or otherwise has come to be located below the top of an aquifer), chemical analysis will likely be used to prove any observed release for this site. As complete sample results have not yet been received at the time of writing, observed release criteria are not shown in Table 1.

TABLE 1
Dimensions and Containment Characteristics for Potential Sources

Source Name	Source Type (per HRS)	Surface Area* (acres)	Average Depth* (feet bgs)	Volume* (acre feet)	Depth Observed with Geoprobe® feet bgs)	Cover Present?	Liner Present?	Leachate Collection System Present?	Run-on/ Run-off Controls Present?
Sludge Pond 3	Backfilled Surface Impoundment	20	8	160	16	Yes (wood chips only), cover not complete (Photo 9)	No	No	No
Sludge Pond 4	Surface Impoundment	23	10	230	6.5-8	No, some vegetation (Photo 10)	No	No	No
Sludge Pond 5	Surface Impoundment	24	14	336	16.5	No, some vegetation (Photos 2, 3)	No	No	No
Sludge Pond 17	Surface Impoundment	24	7.2	173	12-13.5	No, some vegetation (Photo 11)	No	No	No
Emergency Spill Pond (Pond 8)	Surface Impoundment	24	5	120	5.6 in dry cell	No, some vegetation (Photo 12)	No	No	No
Pond 2	Surface Impoundment	121	11.7	1414	NA	No, some vegetation (Photo 13)	No	No	No
Landfill A	Landfill	11	NA	NA	NA	Yes, 18” clay, vegetation (Photo 14)	No	No	No
Landfill 6	Landfill	16	6.1	97	NA	Yes, 18” clay, vegetation (Photo 15)	No	No	No
Landfill G	Landfill	4	NA	NA	NA	Yes, 18” clay, vegetation (Photo 16)	No	No	No
Former landfarm	Landfarm	36	NA	NA	NA	No, largely vegetated (Photo 8)	No	No	No
Pile near Landfill A	Pile, other	1.95§	NA	NA	NA	No, unvegetated (Photo 5)	No	No	No

* From Smurfit-Stone ‘Pond Statistics,’ undated.
§ Estimated from aerial photograph.
NA Not applicable
Unk Unknown

Please see the PA report (UOS 2011a) for a detailed summary of each potential source.

It should be noted that high concentrations of hydrogen sulfide and methane gases were observed being released from boreholes and groundwater monitoring wells installed within all four sludge ponds, and to a lesser degree at all three landfills. Due to safety concerns, UOS began monitoring the ambient air quality in the breathing zone utilizing a TVA-1000 photoionization detector/flame ionization detector (PID/FID) and a MultiRAE H_2S gas monitor at each borehole/groundwater well location during installation and sampling activities (Photo 17).

4.2 TARGETS

The occurrence of HRS-eligible wetlands within the Clark Fork River drainage could not be confirmed on the ground. The U.S. Fish and Wildlife Service National Wetlands Inventory identifies two palustrine scrub-shrub wetlands (of 0.13 mile and 0.34 mile in length) occurring within an island complex due west of Pond 13A (USFWS 2011). These wetlands were inaccessible during the field event and could not be easily ascertained from the eastern shore of the river (Photo 18, Figure 2).

Although the stretch of river adjacent to the mill site is considered a fishery with a Montana Fish, Wildlife and Parks (MFWP) fishery resource value of 1 (Outstanding) (MFWP 2011), no fisherman were observed during the field activities. This may simply have been due to the season (late fall) and timing of the field work (mostly weekdays). Two MFWP fishing access sites are located in the vicinity of the site (approximately 0.5 mile upstream of the southern mill site boundary, and beginning approximately 2.5 miles downstream of the mill site), but neither site was visited during the field activities. The only evidence of recreation on the stretch of the river adjacent to the mill noted during the field work was tire tracks and the remains of a campfire on a sand bar west of Pond 11 (Photo 19).

Sensitive or threatened environments or species were not observed during this site inspection.

Access to the areas of the Smurfit-Stone property containing the sources investigated is controlled. Evidence of recreational activities (e.g. ATV tracks, discarded beer cans) was not observed on or near any of the source areas.

5.0 LIST OF REFERENCES

Montana Audubon. 2009. Clark Fork River – Grass Valley, Important Bird Area. Brochure. February 2009.

Montana County Rural Initiatives. 2010. Facts Related to Agriculture and Other Natural Resources Associated with the Smurfit Stone Mill. January 11, 2010.

Montana Department of Fish, Wildlife and Parks. 2011. Montana Fisheries Information System (MFISH) Query. Available at: http://fwp.mt.gov/fishing/mFish/. Queried August, 2011.

Montana Department of Revenue. 2011. Online parcel search of Montana Cadastral Mapping database. Available at http://www.gis.mt.gov. Accessed September 2011.

Smurfit-Stone. Undated. Document entitled 'Missoula Mill Pond Statistics'. One page. Compiled by Terry McGlaughlin of Smurfit-Stone.

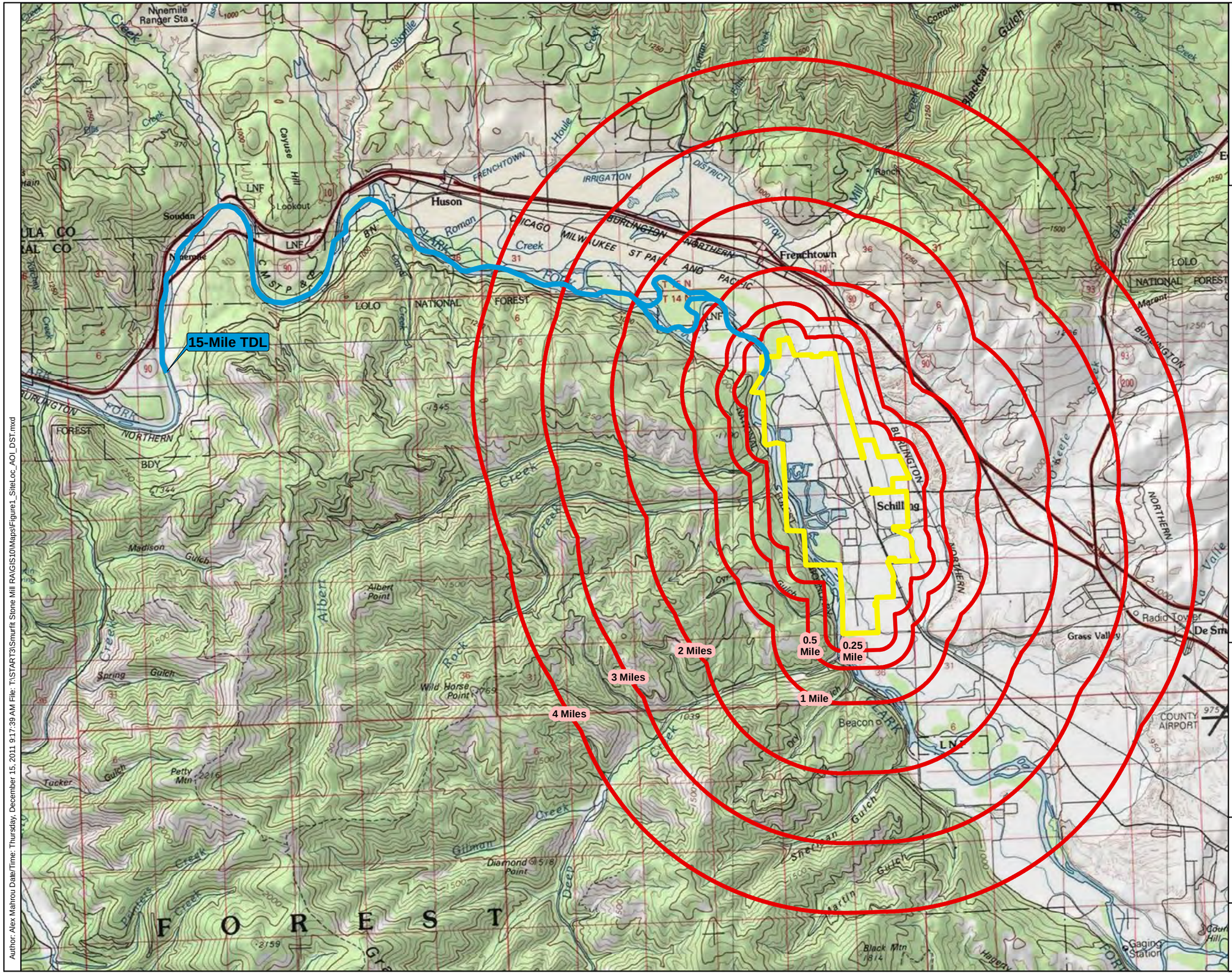
U.S. Fish and Wildlife Service (USFWS). 2011. National Wetlands Inventory Database. Branch of Resource and Mapping Support. www.fws.gov/wetlands/Data/index.html. Accessed December 2011.

U.S. Geological Survey (USGS). 1999. Primrose, Montana 7.5' Quadrangle. ISBN: 978-0-607-94665-9. 1999.

URS Operating Services, Inc. (UOS). 2005. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8." September 2005.

URS Operating Services. 2011a. Preliminary Assessment, Smurfit-Stone Mill, Missoula, Missoula County, Montana. Interim Final. Dated September 14, 2011.

URS Operating Services. 2011b. Field Sampling Plan for a Removal Assessment, Smurfit-Stone Mill, Missoula, Missoula County, Montana. TDD No. 1105-09 (Final). Dated October 21, 2011.



Legend

- Clark Fork 15-Mile Target Distance Limit
- 4-Mile Area of Influence
- Mill Site Boundary

TDD Title: **Smurfit-Stone Mill RA and SI**

Figure Title: Site Location, Area of Influence, and 15-Mile Downstream Target Distance Limit

Figure No. 1
TDD State: MT
TDD County: Missoula
TDD: 1105-09
Date: 12/2011

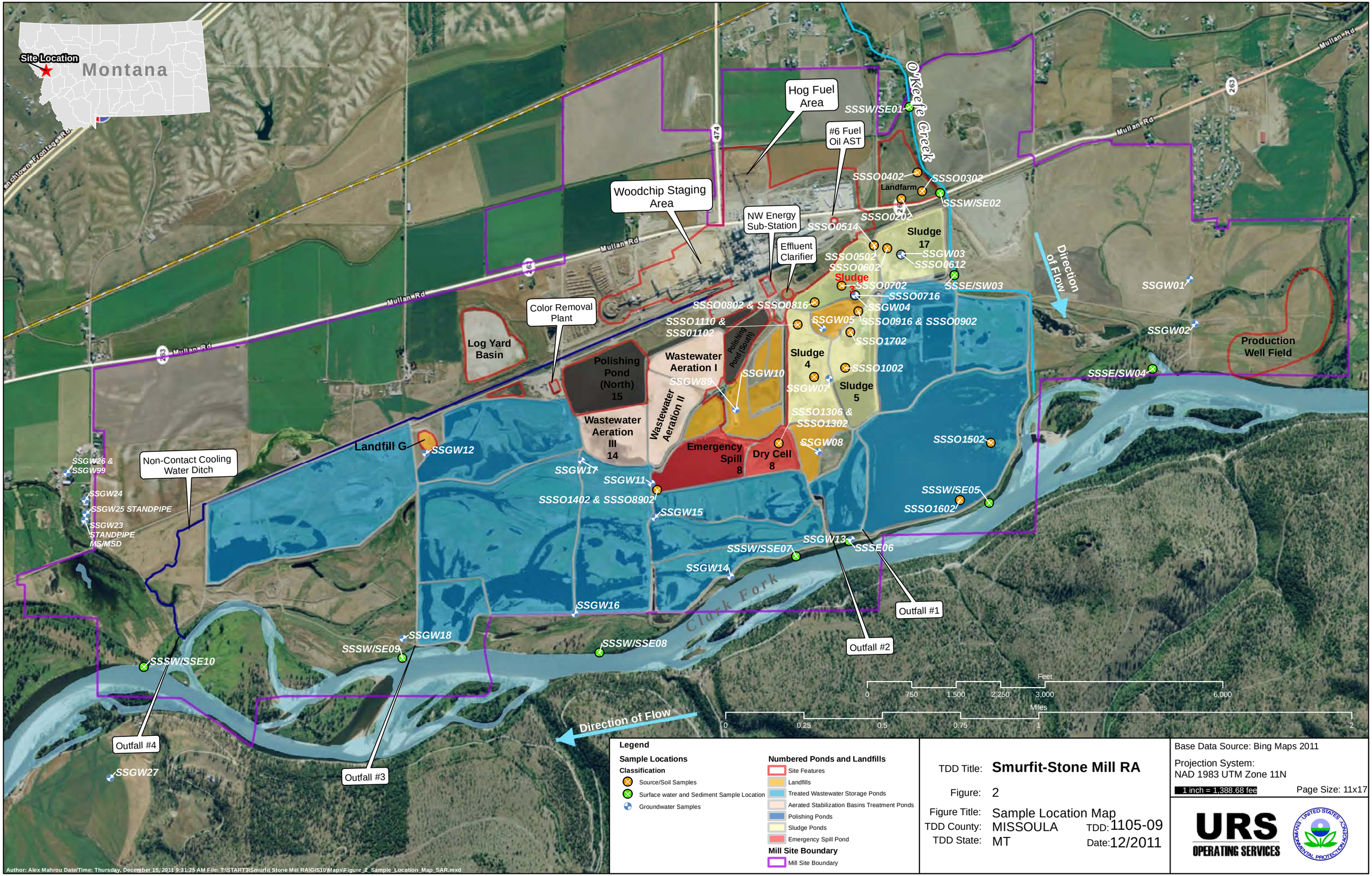
Base Data Source: Bing Maps 2011
Datum/Projection: NAD 1983 UTM Zone 11N
Page Size: 11x17

1 0.5 0 1 Miles

N

URS OPERATING SERVICES

Author: Alex Mahrou Date/Time: Thursday, December 15, 2011 9:17:39 AM File: T:\START3\Smurfit Stone Mill RA\GIS\10\Maps\Figure1_SiteLoc_AOI_DST.mxd



Legend

Sample Locations

Classification

- Source/Soil Samples
- Surface water and Sediment Sample Location
- Groundwater Samples

Numbered Ponds and Landfills

- Site Features
- Landfills
- Treated Wastewater Storage Ponds
- Aerated Stabilization Basins Treatment Ponds
- Polishing Ponds
- Sludge Ponds
- Emergency Spill Pond

Mill Site Boundary

- Mill Site Boundary

TDD Title: **Smurfit-Stone Mill RA**

Figure: 2

Figure Title: Sample Location Map

TDD County: MISSOULA TDD: 1105-09

TDD State: MT Date: 12/2011

Base Data Source: Bing Maps 2011

Projection System: NAD 1983 UTM Zone 11N

1 inch = 1,388.68 fee

Page Size: 11x17

URS OPERATING SERVICES

Author: Alex Mahrou Date/Time: Thursday, December 15, 2011 9:31:25 AM File: T:\START3\Smurfit Stone Mill RA\GIS10\Maps\Figure_2_Sample_Location_Map_SAR.mxd

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Soil/Source	SSSO0102	Surface soil grab sample from mill property to the north (upwind) of potential source areas.	Determine background surface soil conditions on site.
	SSSO0202	Surface soil/source grab sample from landfarm area (most contaminated location).	Characterize on-site sources and contamination.
	SSSO0302	Surface soil/source grab sample from landfarm area.	Characterize on-site sources and contamination.
	SSSO0402	Surface soil/source grab sample from landfarm area.	Characterize on-site sources and contamination.
	SSSO0502	Surface soil/source grab sample from Sludge Pond 17.	Characterize on-site sources and contamination.
	SSSO0514	Subsurface soil/source grab sample from Sludge Pond 17.	Characterize on-site sources and contamination.
	SSSO0602	Surface soil/source grab sample from Sludge Pond 17.	Characterize on-site sources and contamination.
	SSSO0612	Subsurface soil/source grab sample from Sludge Pond 17.	Characterize on-site sources and contamination.
	SSSO0702	Surface soil/source grab sample from Sludge Pond 3.	Characterize on-site sources and contamination.
	SSSO0716	Subsurface soil/source grab sample from Sludge Pond 3.	Characterize potential on-site sources and contamination.
	SSSO0802	Surface soil/source grab sample from Sludge Pond 3.	Characterize potential on-site sources and contamination.
	SSSO0816	Subsurface soil/source grab sample from Sludge Pond 3.	Characterize potential on-site sources and contamination.
	SSSO0902	Surface soil/source grab sample from Sludge Pond 5.	Characterize potential on-site sources and contamination.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Soil/Source (cont.)	SSSO0916	Subsurface soil/source grab sample from Sludge Pond 5.	Characterize potential on-site sources and contamination.
	SSSO1002	Surface soil/source grab sample from Sludge Pond 5.	Characterize potential on-site sources and contamination.
	SSSO10xx	Subsurface soil/source grab sample from Sludge Pond 5. **[not collected due to lack of safe access]**	Characterize potential on-site sources and contamination.
	SSSO1102	Surface soil/source grab sample from Sludge Pond 4.	Characterize potential on-site sources and contamination.
	SSSO1110	Subsurface soil/source grab sample from Sludge Pond 4.	Characterize potential on-site sources and contamination.
	SSSO1202	Surface soil/source grab sample from Sludge Pond 4.	Characterize potential on-site sources and contamination.
	SSSO12xx	Subsurface soil/source grab sample from Sludge Pond 4. **[not collected due to lack of safe access]**	Characterize potential on-site sources and contamination.
	SSSO1302	Surface soil/source grab sample from Emergency Spill Pond (8) dry cell.	Characterize potential on-site sources and contamination.
	SSSO1306	Subsurface soil/source grab sample from Emergency Spill Pond (8) dry cell.	Characterize potential on-site sources and contamination.
	SSSO1402	Surface soil/source grab sample from Emergency Spill Pond (8) wet cell.	Characterize potential on-site sources and contamination.
	SSSO14xx	Subsurface soil/source grab sample from Emergency Spill Pond (8) wet cell. **[not collected due to lack of safe access]**	Characterize potential on-site sources and contamination.
	SSSO1502	Surface soil/source grab sample from Pond 2.	Characterize potential on-site sources and contamination.
	SSSO1602	Surface soil/source grab sample from Pond 2.	Characterize potential on-site sources and contamination.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Soil/Source (cont.)	SSSO1702	Surface soil/source grab sample from area of what appeared to be exposed soil/sludge adjacent to Landfill A.	Characterize potential on-site sources and contamination.
Surface Water and Sediment	SSSW/SE01	Grab sample collected from O'Keefe Creek immediately upstream of the PPE from the landfarm area.	Document background conditions along O'Keefe Creek.
	SSSW/SE02	Grab sample collected from O'Keefe Creek immediately downstream of the PPE from the landfarm area.	Document potential site impacts to the surface water pathway along O'Keefe Creek downstream of the landfarm area.
	SSSW/SE03	Grab sample collected from O'Keefe Creek immediately downstream of Sludge Pond 17.	Document potential site impacts to the surface water pathway along O'Keefe Creek downstream of Sludge Pond 17.
	SSSW/SE04	Grab sample collected from the Clark Fork River immediately upstream of potential source areas of the mill.	Document background conditions along the Clark Fork River.
	SSSW/SE05	Grab sample collected from the Clark Fork River adjacent to Pond 2.	Document potential site impacts to the surface water pathway along the Clark Fork River.
	SSSW/SE06	Grab sample collected from the Clark Fork River immediately downstream of Outfall 1.	Document potential site impacts to the surface water pathway along the Clark Fork River downstream of Outfall 1.
	SSSW/SE07	Grab sample collected from the Clark Fork River immediately downstream of Outfall 2.	Document potential site impacts to the surface water pathway along the Clark Fork River downstream of Outfall 2.
	SSSW/SE08	Grab sample collected from Clark Fork River adjacent to Pond 13.	Document potential site impacts to the surface water pathway along the Clark Fork River.
	SSSW/SE09	Grab sample collected from the Clark Fork River immediately downstream of Outfall 3.	Document potential site impacts to the surface water pathway along the Clark Fork River downstream of Outfall 3.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Surface Water and Sediment (Cont)	SSSW/SE10	Grab sample collected from the Clark Fork River immediately downstream of Outfall 4.	Document potential site impacts to the surface water pathway along the Clark Fork River downstream of Outfall 4.
Groundwater	SSGW01	Shallow aquifer groundwater grab sample collected from existing monitoring well located upgradient of mill (e.g. SMW-20).	Determine background conditions of groundwater in shallow aquifer.
	SSGW02	Deeper aquifer groundwater grab sample collected from existing production well located upgradient of mill (exact well TBD).	Determine background conditions of groundwater in deeper aquifer.
	SSGW03	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Sludge Pond 17.	Document potential site impacts on shallow groundwater aquifer.
	SSGW04	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Sludge Pond 3.	Document potential site impacts on shallow groundwater aquifer.
	SSGW05	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Landfill A.	Document potential site impacts on shallow groundwater aquifer.
	SSGW06	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Sludge Pond 4. **[not collected due to lack of safe access]**	Document potential site impacts on shallow groundwater aquifer.
	SSGW07	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Sludge Pond 5.	Document potential site impacts on shallow groundwater aquifer.
	SSGW08	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Landfill 6.	Document potential site impacts on shallow groundwater aquifer.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Groundwater (cont.)	SSGW09	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Emergency Spill Pond. **[not collected due to lack of safe access]**	Document potential site impacts on shallow groundwater aquifer.
	SSGW10	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Pond 20 (Landfill E).	Document potential site impacts on shallow groundwater aquifer.
	SSGW11	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located downgradient of aeration basins.	Document potential site impacts on shallow groundwater aquifer.
	SSGW12	Shallow aquifer groundwater grab sample collected from temporary Geoprobe® well located within or downgradient of Landfill G.	Document potential site impacts on shallow groundwater aquifer.
	SSGW13	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-14 (adjacent to Clark Fork River).	Document potential site impacts on shallow groundwater aquifer.
	SSGW14	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-13 (adjacent to Clark Fork River).	Document potential site impacts on shallow groundwater aquifer.
	SSGW15	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-17 (downgradient of most potential sources).	Document potential site impacts on shallow groundwater aquifer.
	SSGW16	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-11 (adjacent to Clark Fork River).	Document potential site impacts on shallow groundwater aquifer.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Groundwater (cont.)	SSGW17	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-19 (downgradient of most potential sources).	Document potential site impacts on shallow groundwater aquifer.
	SSGW18	Shallow aquifer groundwater grab sample collected from existing groundwater monitoring well SMW-10 (adjacent to Clark Fork River).	Document potential site impacts on shallow groundwater aquifer.
	SSGW19	Deeper aquifer groundwater grab sample collected from existing domestic well located within landfarm area (Shields well). **[well did not exist at presumed location]**	Document potential site impacts on deeper groundwater aquifer.
	SSGW20	Deeper aquifer groundwater grab sample collected from existing domestic well located adjacent to Pond 18 (Peterson well). **[owner was not home to enable access]**	Document potential site impacts on deeper groundwater aquifer.
	SSGW21	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (Linton well). **[well did not exist at presumed location]**	Document potential site impacts on deeper groundwater aquifer.
	SSGW22	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (D and P Lucier well). **[well did not exist at presumed location]**	Document potential site impacts on deeper groundwater aquifer.
	SSGW23	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (K and D Stenerson well).	Document potential site impacts on deeper groundwater aquifer.
	SSGW24	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (D and L Nielsen well).	Document potential site impacts on deeper groundwater aquifer.

TABLE 2
Sample Locations and Rationale

Matrix	Sample #	Location	Rationale
Groundwater (cont.)	SSGW25	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (DL Stenerson well).	Document potential site impacts on deeper groundwater aquifer.
	SSGW26	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (D and L Lucier well).	Document potential site impacts on deeper groundwater aquifer.
	SSGW27	Deeper aquifer groundwater grab sample collected from existing domestic well located downgradient of mill (Clark Fork Cattle Ranch well).	Document potential site impacts on deeper groundwater aquifer.
QA/QC (water)	SSGW89	Duplicate of sample SSGW10. (MS/MSD will also be collected here. 3 x volume for water)	Document the precision of sample collection procedures and laboratory analysis.
	SSGW99	Duplicate of sample SSGW26.	Document the precision of sample collection procedures and laboratory analysis.
QA/QC (soil/sludge/sediment)	SSSO89	Replicate of SSSO1402. (MS/MSD will also be collected here (2 x volume for sludge).	Document the precision of sample collection procedures and laboratory analysis.
	SSSO99	Replicate of SSSO1302. (MS/MSD was also collected here (2 x volume for sludge).	Document the precision of sample collection procedures and laboratory analysis.
QA/QC (blanks)	SSSW89	Rinsate blank.	Document thoroughness of decontamination procedures.
	SSSW99A, B, C	Trip blanks.	Document cross-contamination of VOC samples.

APPENDIX

Photolog

Photo 1
Geoprobe® stuck in Sludge Pond 4 due to soft surface. John Noto (UOS) on left. Looking east.

Photo 2
Geoprobe® at location SSGW07 on berm between sludge ponds 4 (far right) and 5 (left). Looking west.

Photo 3
SSSO09 source sample location at edge of Sludge Pond 5. Looking northwest.

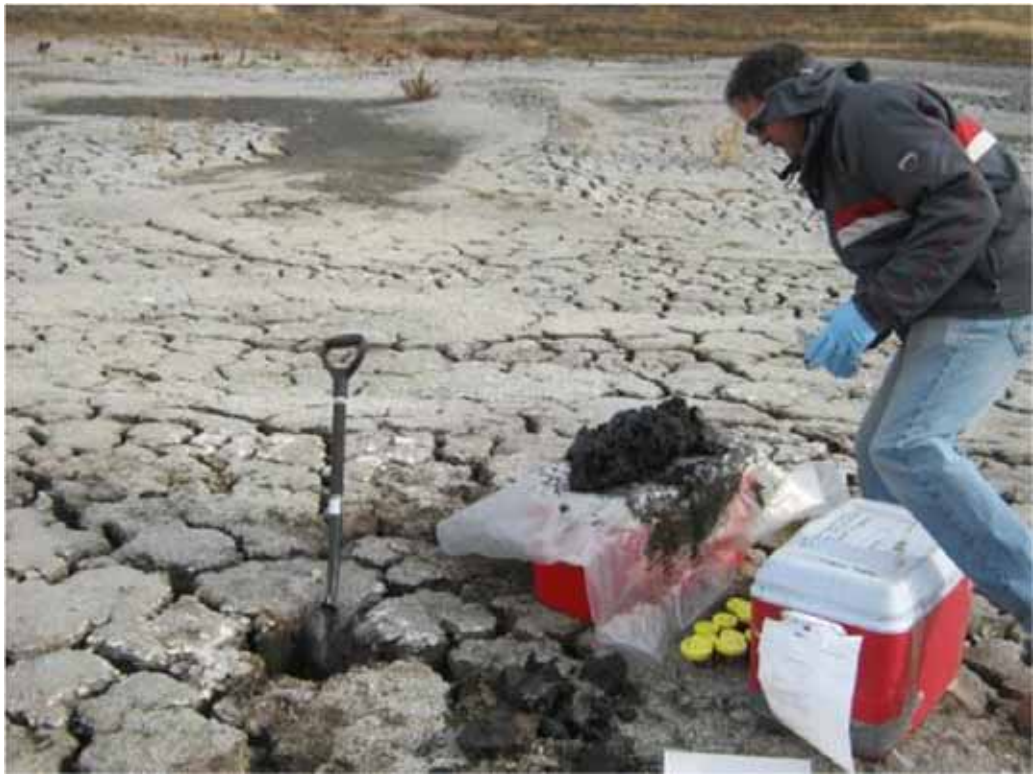


Photo 4
John Noto (UOS) collecting surface soil/ source sample SSSO1402 at northern end of Emergency Spill Pond. Looking east.

Photo 5
John Noto (UOS) collecting SSSO1702 opportunity surface soil/ source sample from area of possible sludge adjacent to Landfill A. Note sinkhole in background and lack of cover. Looking north.

Photo 6
John Noto (left) and Jeff Miller (right)(both UOS) collecting rinsate sample SSSW89 from shovel used to collect some surface soil samples.

Photo 7
Aerial photo (undated) showing former landfarm area (area with linear piles in bottom half of photo).

Photo 8
Jeremiah Ervin (UOS) collecting asbestos sample SSSO0302 from unvegetated area within former landfarm area. Looking north.

Photo 9
Wood chip covering over Sludge Pond 3. John Noto (UOS) and Carlo Arendt (Hydrometrics, Inc.) collecting SSSO0702 source sample in background. Looking southwest.

Photo 10
Northern berm of Sludge Pond 4 showing layering of sludge, standing water, and lack of cover. Looking east.

Photo 11
Geoprobe® at sample location SSSO0514 within Sludge Pond 17. Photo shows sparse vegetation and pond infall in foreground. Looking southwest.

Photo 12
Northern end of Emergency Spill Pond wet cell showing standing water and lack of cover. Geoprobe® is at location SSGW11 on northern berm of pond. Looking northeast.

Photo 13
Scott Mason (Hydrometrics, left) and Jeff Miller (UOS, right) collecting surface soil/ source sample SSSO1602 from Wastewater Pond 2. Note sparse vegetation and lack of cover. Looking south.

Photo 14
Geoprobe® on top of Landfill A at SSGW05 location. Note vegetative cover. Looking northeast.

Photo 15
Geoprobe® on top of Landfill 6 (edge of landfill is roughly marked by the lighter vegetation in the distance) at SSGW08 location. Note vegetative cover. Looking north.

Photo 16
Geoprobe® at northwest corner of Landfill G (raised area in background) at SSGW12 location. Note vegetative cover. Looking east.

Photo 17
John Noto (UOS) conducting air monitoring of the breathing zone during installation of SSGW07. Ken Manchester (MSE Technology Applications, Inc.) on right. Looking northeast.

Photo 18
Photo showing USFWS-identified wetlands on an island across the Clark Fork River (far background). UOS was unable to access these wetlands during the assessment. John Noto (UOS) and Carlo Arendt (Hydrometrics) in foreground collecting surface water sample SSSW09. Looking west.

Photo 19
Evidence of recreation (tire tracks beneath date stamp) on sand bar within Clark Fork River, adjacent to Pond 11. The remains of a camp fire are off the picture to the right. Looking northeast.